

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
FWCC Request for Declaratory Ruling on)	
Partial-Band Licensing of Earth)	IB Docket No. 00-203
Stations in the Fixed-Satellite Service)	RM-9649
That Share Terrestrial Spectrum)	
)	
FWCC Petition for Rulemaking to Set)	
Loading Standards for Earth Stations)	
In the Fixed-Satellite Service that)	
Share Terrestrial Spectrum)	
)	
Onsat Petition for Declaratory Order that)	
Blanket Licensing Pursuant to Rule 25.115(c) Is)	SAT-PDR-19990910-00091
Available for Very Small Aperture Terminal)	
Satellite Network Operations at C-Band)	
)	
Onsat Petition for Waiver of Rule 25.212(d) to)	
the Extent Necessary to Permit Routine)	
Licensing of 3.7 Meter Transmit and Receive)	
Stations at C-Band)	
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<i>Ex parte</i> Letter Concerning Deployment of)	
Geostationary Orbit FSS Earth Stations in the)	
Shared Portion of the Ka-band)	

**COMMENTS OF THE SATELLITE INDUSTRY ASSOCIATION, THE
SATELLITE BROADCASTING AND COMMUNICATIONS ASSOCIATION,
THE WORLD TELEPORT ASSOCIATION, AND THE AEROSPACE
INDUSTRIES ASSOCIATION OF AMERICA**

January 8, 2001

SUMMARY

The Satellite Industry Association, the Satellite Broadcasting and Communications Association, the World Teleport Association, and the Aeronautical Industries Association of America strongly oppose the radical changes in Commission policy regarding access to spectrum for satellite services that have been requested by the Fixed Wireless Communications Coalition (“FWCC”) and are now proposed, in modified form, in the *Notice*. The new rules suggested here would reverse long-standing policies in favor of flexibility for earth station operations and are completely inconsistent with the Commission’s recent history of streamlining application processes and deregulating satellite services. Furthermore, there is absolutely no evidence that the rule changes are needed. Therefore, the FWCC’s proposals should be rejected without further action. However, the Commission should adopt the Hughes proposal for streamlined licensing of Ka-band terminals.

The FWCC Petition simply should never have gotten to the Notice of Proposed Rulemaking stage. From the outset, the FWCC failed to satisfy its burden of justifying a change in the Commission’s rules. The Petition was met by a unanimous chorus of commenters opposing the FWCC’s suggestions, including a number of entities with strong interests in terrestrial fixed wireless operations. The opposing parties demonstrated in detail that the existing Commission policies being attacked by the FWCC were designed to ensure that both satellite services and terrestrial operations have reasonable access to shared spectrum and operate efficiently. Because of these policies, satellite services have expanded significantly

and today play a critical role in the nation's telecommunications infrastructure.

The fixed wireless community also has grown and prospered under these policies.

The rule changes sought by the FWCC would impair, rather than promote, efficient spectrum use. Today, coordination of shared spectrum relies on the good faith and business judgment of earth station and terrestrial operators alike. The FWCC would have the Commission replace that system with a framework of complicated regulatory requirements that would unnecessarily burden earth station operators and the Commission staff, increasing the costs of satellite services for all users.

Under the new rules, an earth station operator that has denied coordination for a new proposed terrestrial link would be required to demonstrate past, current or imminent future use of the specific frequency requested. These rules would deprive satellite operators of the flexibility they need to respond to changing customer requirements; restore service in the event of a facility failure; make adjustments to facilitate coordination with adjacent satellites; launch replacement satellites that take advantage of technological advances; and manage overall network capacity efficiently. Future satellite needs for particular frequencies at particular locations cannot be predicted on an "imminent" basis.

The *Notice* provides no standards for evaluating a usage showing that would fairly take into account the many factors relevant to earth station spectrum requirements. Furthermore, the Commission ignores the substantial burden that would be placed on earth station operators, who would be required to track

historical usage on a frequency-specific basis and disclose sensitive business data to third parties.

The *Notice* also proposes that determinations regarding earth station usage be made by frequency coordinators, who lack the authority to interpret Commission policies and the expertise to evaluate the full range of issues involved. The likely result will be a significant number of disputed cases that must be resolved by the Commission, further burdening the Commission's limited resources.

The proposed rules would also change procedures relating to coordination in shared spectrum. First, a satellite or terrestrial operator that relied on a particular coordination model to site its station initially would be required to accept the use of the same model in future coordinations. There are several flaws with this proposal. At the outset, there is no evidence that a new regulation is needed to ensure that terrestrial and satellite operators use interference models consistently. In addition, the technical factors involved in a coordination can vary widely, even when the same two locations are involved. Thus, an interference model from one coordination may not be relevant to a later coordination if other factors are different. Finally, the rule fails to account appropriately for changes in the interference environment.

Second, the *Notice* proposes that if an operator accepted interference that would prevent that operator from achieving accepted interference objectives for a given channel, the operator would not be entitled to future protection on that frequency within the same set of technical parameters. Again, however, there is no evidence justifying adoption of this new policy. Furthermore, the *Notice* assumes

that there would be common agreement on what “accepted interference objectives” would be for any given earth station. In fact, however, the link budget of an earth station depends on a wide range of factors, and a level of interference that might be unacceptable for one operator could be acceptable for another. For this reason, attempting to come up with a “one size fits all” policy is an exercise in futility.

In short, the FWCC proposals clearly fail a basic cost-benefit analysis. They would restrict the flexibility of satellite operations in a way that is contrary to established Commission policies, and there is no evidence that the new rules would significantly benefit terrestrial operations.

Unlike the FWCC proposals, the rule changes suggested by Hughes to facilitate deployment of terminals in shared 18 GHz spectrum are in the public interest and should be adopted. The Hughes proposals would streamline licensing processes, reducing burdens on both applicants and the Commission, and speed the delivery of next-generation satellite services to end users.

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INDUSTRIES ASSOCIATION OF AMERICA**

The Satellite Industry Association, the Satellite Broadcasting and Communications Association, the World Teleport Association, and the Aerospace Industries Association of America (collectively, the “Satellite Industry Coalition” or the “Coalition”) hereby submit comments in response to the *Notice of Proposed*

Rulemaking in the above-captioned proceeding, FCC 00-369 (rel. Oct. 24, 2000) (the “*Notice*”).

The associations that make up the Satellite Industry Coalition represent companies involved in every aspect of the delivery of satellite services, including space station and earth station operators, programmers, equipment manufacturers and launch service providers. We join here in providing these unprecedented joint industry comments because we believe the changes in satellite earth station licensing and coordination proposed by the Fixed Wireless Communications Coalition (“FWCC”) and reflected in the *Notice* are fundamentally misguided and could have devastating consequences for the satellite industry. The FWCC’s claim that current rules unfairly disadvantage terrestrial operators in spectrum that is shared on a co-primary basis between terrestrial and satellite services is completely unsupported. The FWCC’s proposals would impose extensive new regulatory requirements on satellite service licensees, and would make coordination more difficult and burdensome for terrestrial and satellite operators alike.

In short, the rule changes sought by the FWCC are unnecessary, intrusive, and inconsistent with the public interest. The Commission should reject them and terminate that portion of the proceeding.

The Coalition, however, supports the proposal of Hughes Network Systems (“Hughes”) for streamlined blanket licensing of terminals in shared 18 GHz spectrum.

BACKGROUND AND INTRODUCTION

The four associations that comprise the Coalition represent the full breadth of the satellite communications industry. The Satellite Industry Association (“SIA”) is a national trade association representing the leading U.S. satellite manufacturers, service providers, and launch service companies. The SIA serves as an advocate for the commercial satellite industry on regulatory and policy issues of common concern.¹ The Satellite Broadcasting and Communications Association (“SBCA”) is the national trade association representing the consumer satellite industry. The SBCA is committed to expanding the utilization of satellite technology for the broadcast delivery of video, data and voice services.² The World Teleport Association (“WTA”) is a nonprofit trade association of teleports (satellite uplink hubs), satellite and terrestrial carriers, technology providers, engineering firms, capital providers and consultants in twenty nations around the world.³ The

¹ The SIA’s corporate members include: Astrolink, The Boeing Company, Ellipso, Inc., Final Analysis, Inc., GE American Communications, Inc., Globalstar, Hughes Electronics Corp., Lockheed Martin Corporation, Loral Space & Communications, Motient Corp., Orbital Sciences Corp., PanAmSat Corporation, Teledesic, TRW Inc., and Williams Vyvx Services.

² The SBCA is composed of over 2,000 DBS and other satellite service providers, programmers, equipment manufacturers, distributors, retailers, encryption vendors, and national/regional distribution companies.

³ WTA’s corporate membership of 115 includes all of the leading North American operators of satellite uplinking facilities (Verestar, Globecast, Williams Vyvx, Lockheed Martin, Globecom Systems, Teleglobe Communications, BT Broadcast Services, Videocom, Triumph Communications, and others), as well as INTELSAT, PanAmSat, Telesat Canada, Satmex, GE Americom, Qwest Communications, Verizon, Lucent Technologies, Cisco Systems, Scientific-Atlanta, and Nortel. For these members, WTA is the global body that promotes their

Aerospace Industries Association (“AIA”) of America is the premier trade association representing the nation’s manufacturers of commercial, military, and business aircraft, helicopters, aircraft engines, missiles, spacecraft, materials, and related components and equipment.⁴

The Coalition’s members have a strong interest in the spectrum at issue in this proceeding. Satellite service operators and customers rely heavily today on spectrum that is shared with terrestrial systems at C-band and in the extended Ku-band, and demand for satellite services in the Ka-band is projected to be high as well. Spectrum sharing already places a significant burden on the

interests, researches their market, feeds them sales leads from around the world, and connects them to strategic allies.

⁴ AIA’s 65 corporate members include: AAI Corporation, The Aerostructures Corporation, Alcoa Industrial Components, Alliant Techsystems, Inc., American Pacific Corp., Analytical Graphics Inc., Argo-Tech Corp., Aviall, Inc., BAE SYSTEMS North America Inc., Ball Aerospace & Technologies Corp., Barnes Aerospace, The BFGoodrich Company, Aerostructures Landing Systems Maintenance, Repair and Overhaul Sensors and Integrated Systems, B.H. Aircraft Company, Inc., The Boeing Company, Curtiss-Wright Corp., Davis Tool, Inc., Dowty Aerospace, DRS Technologies, Inc., Ducommun Inc., DuPont Co., Esterline Technologies, Fairchild Dornier Corp., Fairchild Fasteners, Final Analysis, Inc., GenCorp, General Dynamics Corp., General Electric, Genuity Solutions Inc., GKN Aerospace Inc., Groen Brothers Aviation, Inc., Harris Corporation, HEICO Corp., Hexcel Corporation, Honeywell, Hughes Electronics Corp., Interturbine Corp., ITT Industries, Kaman Aerospace Corp., Kistler Aerospace Corp., Litton Industries, Inc., Lockheed Martin Corp., MD Helicopters, Inc., MOOG Inc., The NORDAM Group, Northrop Grumman Corp., Omega Air, Inc., Parker Hannifin Corp., Raytheon Co., Robinson Helicopter Company, Inc., Rockwell Collins, Inc., Rolls-Royce North America Inc., Senior Flexonics Inc., Space Access, LLC, Spectrum Astro, Inc., Stellex Aerostructures, Inc., Swales Aerospace, Teledyne Technologies Inc., Teleflex Inc./TFX Sermatech, Mal Tool & Engineering, Textron, Inc., Triumph Controls, Inc., TRW Inc., United Technologies, Pratt & Whitney, Sikorsky, Hamilton, Sundstrand, Vought Aircraft Industries, Inc., and Woodward Governor Co.

availability of core spectrum for satellite operations, limiting where and how new or modified facilities can be developed in response to customer demand. The difficulties of sharing spectrum between satellite and terrestrial services have increasingly led the Commission to rely on segmentation of spectrum for satellite and terrestrial uses in recent band plans.⁵ In the bands at issue here, however, sharing of spectrum is and will continue to be a fact of life for both the satellite and terrestrial industries.

In its Petition,⁶ the FWCC claimed that current Commission policies favor satellite services at the expense of fixed service operations in shared spectrum. The FWCC therefore sought radical changes in Commission rules regarding licensing and coordination of earth station operations in shared bands. The *Notice* wisely rejects the most extreme of the FWCC's suggested rule modifications, but proposes to adopt some rule changes in response to the arguments made by the FWCC.

As discussed in more detail below, there are two fundamental problems with the FWCC proposals reflected in the *Notice*. First, they represent a solution in search of a problem. An examination of the record that was developed in response to the FWCC Petition reveals absolutely no concrete evidence that fixed

⁵ See, e.g., *Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use*, 15 FCC Rcd 13430, 13438-39 (2000).

⁶ Request for Declaratory Ruling and Petition for Rule Making of the Fixed Wireless Communications Coalition, May 5, 1999 ("FWCC Petition").

service licensees are being unfairly excluded from operations in shared spectrum. Not a single fixed service provider filed in support of the FWCC Petition to supply evidence of the claims of inequity made by the FWCC. Instead, the Petition was met with substantial opposition from every service provider that filed,⁷ including a number of companies who rely on both satellite and terrestrial services and thus have a clear interest in seeing that the rules treat each type of operation fairly.⁸

Thus, the most puzzling thing about the *Notice* is the fact that it exists at all, given the complete absence of any proof of circumstances justifying a change in the rules. Rather than supporting the Petition, the record to date clearly demonstrates that existing licensing and coordination procedures are rationally designed to reflect the basic differences in the way terrestrial and satellite services operate and to promote efficient spectrum use by each service.

Second, the *Notice* is problematic because the proposed solutions put forward to address FWCC's allegations are unduly intrusive and burdensome and would threaten the satellite industry's ability to provide reliable and effective service to users. In particular, the proposals would unreasonably limit the flexibility needed for satellite systems to respond rapidly when emergencies arise; to adapt when equipment fails; to satisfy the ever-changing needs of satellite

⁷ Another fixed wireless industry group, the Fixed Point-to-Point Communications Section of the Wireless Communications Division of the Telecommunications Industry Association, made the only filing in support of the FWCC Petition. *See Notice* at Appendix A.

⁸ *See, e.g.,* Opposition of Sprint Corporation, Reply and Opposition of MCI WorldCom, Inc.; Reply Comments of ATC Teleports, Inc.

customers; to implement operator-to-operator coordination agreements; and to institute advances in the state of the art. Furthermore, the rule changes would also impose substantial administrative burdens and potentially require earth station operators to disclose competitively sensitive information. Decision-making authority in some instances would be placed in the hands of frequency coordinators who lack the qualifications to be engaged in adjudicative functions requiring interpretation of Commission policies.

Under existing policies, coordination in shared spectrum is a give and take process in which reasonable technical analysis and compromise are the rule, rather than the exception. The changes proposed here would fundamentally alter the nature of the coordination process by attempting to impose rigid one-size-fits-all requirements that are ill-suited to addressing the wide range of factual circumstances and technical parameters present in each individual coordination attempt. Every coordination is different, and current rules sensibly leave it to the parties themselves to evaluate the business, technical, and other issues that must be weighed. The proposals here would sacrifice that proven approach in exchange for a raft of new rules that would burden both satellite and terrestrial operators without evidence that any party will be better off. This represents a complete turnaround from the Commission's trend of deregulating satellite operations.⁹

⁹ In fact, the *Notice* acknowledges that the proposed rule changes sought by the FWCC “appear to be inconsistent with the Commission’s general trend towards less intrusive regulation of the manner in which licensees use spectrum.” *Notice* at ¶ 61. The Commission suggests that the changes are nevertheless appropriate spectrum

Instead of increasing the efficiency of spectrum use, the *Notice's* proposed rules would impair the ability of satellite users to manage their networks efficiently, putting at risk the multi-billion dollar investment in satellite space station and ground segment facilities.¹⁰ The *Notice*, moreover, overlooks the inherent differences between the satellite and terrestrial services. The fixed service has low start up costs, short times associated with construction and implementation of a system, and ease of access allowing rapid and inexpensive repair or replacement of a damaged system. Fixed-satellite service earth stations, on the other hand, are inextricably linked with FSS satellites, which have large start up costs, long times associated with construction and implementation of a system, and experience large barriers to the repair or replacement of a damaged system. Therefore, “equality of spectrum efficiency obligations”, which is what this *Notice* attempts to achieve, is not the same thing as “efficient use of shared bandwidth,” which is the Commission’s larger goal. In short, the FWCC proposals contained in the *Notice* clearly fail to satisfy the most elemental cost-benefit analysis and should be rejected.

In contrast to the rule changes sought by the FWCC, the Hughes proposal for blanket licensing of 18 GHz terminals in spectrum shared with terrestrial operations will promote efficient use of spectrum and expedite delivery of

management methods. *Id.* However, as discussed herein, these rules would impede, not promote, efficient spectrum management.

¹⁰ Futron Corporation has estimated that the value of C- and Ku-band satellites serving all or a part of the United States is \$7.5 billion.

services to the public. Implementation of streamlined licensing procedures will reduce administrative costs for both applicants and the Commission, facilitating deployment of state-of-the-art technology.

I. THERE IS NO EVIDENCE TO SUPPORT THE LICENSING AND COORDINATION CHANGES PROPOSED BY THE FWCC

A. The Current Rules Support Satellite Operations that Are Critical to the Nation's Telecommunications Infrastructure

Under existing licensing and coordination rules, satellite service has developed into an essential part of the overall telecommunications infrastructure, supporting a wide range of industries. As the commercial satellite industry has developed, the fixed wireless industry has grown and prospered. Today, C- and Ku-band satellite operations provide video and data transmission nationwide. In addition, the satellite industry plays an important role in the delivery of services that also rely on other technologies, including international telephone trunking, Internet, paging, cable television, and broadcast services.

In fact, an analysis by Futron has shown that satellite services contribute to industries that generate more than *\$1.7 trillion dollars in the United States alone*. See "Industries Enabled by the Space Sector," attached as Exhibit 1. The study notes that almost 3 billion minutes of international telephone traffic are carried over satellite, and in many countries satellite facilities are used to provide a domestic telephone backbone. *Id.* In addition, virtually all broadcast and cable television content is sent via satellite to local affiliates and cable service providers. Satellite services also play an increasing role in the delivery of content as a part of

the Internet infrastructure, supporting e-commerce both domestically and abroad. The global financial services industry relies heavily on satellite facilities for real-time international transactions. Significantly, satellites are also bringing broadband and other telecommunications services to Indian reservations that the terrestrial segment of the information superhighway had bypassed.¹¹

Today's services are only part of the picture. Coming Ka-band services will provide broadband access to all Americans. In fact, the Commission has repeatedly recognized that Ka-band satellite operations may represent the most efficient and economical way to ensure that rural users and urban consumers alike receive access to advanced communications services.¹²

Satellite services also provide critical public safety functions. For example, satellite technology supports the healthcare industry in a number of ways. Satellite-based telemedicine supports the transfer of medical images and information to facilitate diagnosis and treatment. This capability is particularly valuable where other advanced telecommunications infrastructure facilities are lacking, such as rural areas or areas that have been affected by a natural disaster. Wide-area paging for on-call doctors and nurses also relies on satellite coverage, and

¹¹ See *"Dishing Up a New Link to the Internet,"* The Washington Post, Nov. 6, 2000 at A1.

¹² See, e.g., *Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Service, Third Report and Order*, 12 FCC Rcd 22310 (1997)

VSAT networks connecting pharmacies to a central database facilitate the dispensing of prescription drugs and allow pharmacists to check for potentially harmful drug interactions.

In addition, satellites enable the delivery of news information in response to natural disasters or other emergencies. Current rules permit streamlined coordination of transportable earth stations, allowing rapid implementation of additional services to areas hit by storms or other weather emergencies. This enables the delivery of much-needed information both within the affected area and throughout the country. Earth stations also can be deployed temporarily to cover political conventions, elections, sports events, or any other story, from the birth of septuplets to the latest “trial of the century.” Broadcast and cable news operations rely heavily on satellite facilities to supplement other communications links to provide live coverage of these kinds of fast breaking and short-term news events.

The characteristics of satellite systems and current licensing policies combine to ensure that satellites can play these important roles. First, satellite technology is distance insensitive, allowing service to urban and rural areas alike at similar costs. As a result, satellite networks are ideally suited for services that rely on broad coverage and the ability to add new points of communications without putting in place substantial new infrastructure.

Second, satellite systems use spectrum extremely efficiently. A single GSO satellite can serve the continental United States; three GSO satellites can

cover the world; and Commission spacing and technical policies have maximized use of the spectrum/orbital resource. Full frequency re-use is required and recent innovations such as the use of spot beam technology have increased further the ability of space stations to re-use spectrum. The *Notice* describes in detail the extent to which Commission technical rules promote efficiency and facilitate coordination with terrestrial services in shared spectrum. *See Notice* at ¶ 39 & n.71.

Furthermore, the cost characteristics of satellite systems also contribute to efficient use of the systems. A GSO space station represents a huge sunk investment, with typical costs for construction and launch of \$200-\$300 million. Transponder rates must be set to recover these costs. As a result, customers have a strong economic incentive to optimize traffic loading.

Finally, satellite services play a critical role even when they are not used actively. Satellite systems provide redundancy for other telecommunications equipment, allowing wireline and terrestrial wireless services to be used more efficiently. The availability of satellite service as a back-up to other systems provides public interest benefits by increasing the overall reliability of our national telecommunications infrastructure.

B. The Flexibility Built into Current Regulations Is Essential to Continued Efficient Provision of Satellite Services

Current licensing and coordination rules reflect the Commission's acknowledgement that flexibility is necessary to ensure continued efficient operation of satellite systems. As the *Notice* recognizes, the ability to change

frequencies within a band permits earth station operators to respond rapidly to changes in system capabilities or customer demand. *Id.* at ¶ 40. Licensing earth stations across the full band provides “earth station licensees the needed flexibility to change transponders or satellites on short notice, and without having to be re-licensed by the Commission, to meet changing operational requirements.” *Id.* Commission policies give “earth station operators the ability to conform to the constraints placed on the satellite operators and the flexibility to change channels to access available transponder capacity within a satellite network and available capacity on other satellite networks.” *Id.*

In this regard, the *Notice* simply reaffirms the policy framework on which co-primary sharing between satellite services and terrestrial networks was based. As the Commission noted in 1978, “coordination for the entire frequency band and visible arc is our general earth station licensing objective in order to protect our flexibility and that of the satellite operator to change satellite locations and transponder use assignments to best satisfy overall domestic satellite service requirements.”¹³ The Commission warned the applicant in that instance, which had accepted limitations on its frequencies in order to accommodate terrestrial facilities, that the Commission “will not allow restrictions on earth station frequency use resulting from limited terrestrial coordination to restrict the operational flexibility of domestic satellites.” *Id.*

¹³ *American Satellite Corporation*, 72 FCC2d 750, 754 (1978).

This requirement for flexibility is inherent in the nature of satellite services, and clearly justifies differences between the regulation of satellite and terrestrial services. The need for flexibility begins before a new satellite even becomes operational. Prior to commencement of commercial services, coordination with adjacent satellite licensees must take place. The outcome of the coordination will determine what frequency assignments are available for certain types of services. Until initial coordination is completed, a satellite operator cannot determine what channels customers who have committed to purchasing capacity can use. Later, changes may need to be made to accommodate shifts in customer requirements or coordination with new adjacent spacecraft.

Furthermore, unlike terrestrial facilities, a satellite generally cannot be repaired if it experiences partial or complete failure. As a result, restoring service in the event of a failure requires the ability to shift to an operational transponder or another satellite.

To guard against the possibility of service outages, many customers purchase “protected” service. This level of service ensures that if the customer’s primary facility becomes impaired, service will be provided over a different transponder, either on the same spacecraft or a different spacecraft. Failure of a transponder or spacecraft, even for a short time, leads to a “daisy chain” effect. Customers with protected service have their communications restored, thereby displacing customers who have agreed to take pre-emptible service. These customers in turn must attempt to find alternate capacity. It is simply impossible

in advance of a malfunction to predict what frequencies will need to be used at any given earth station whose customers are affected by the failure.¹⁴

For example, when Galaxy IV failed without warning in 1998, PanAmSat needed to take a variety of actions to restore service to customers. In the short term, some customers of Galaxy IV were provided service on other nearby PanAmSat spacecraft. Within a few days after the failure, PanAmSat began moving the C-band Galaxy VI satellite from 74° W.L. to 99° W.L., where Galaxy IV had been positioned. Galaxy VI arrived at that location and was available for service to C-band customers of Galaxy IV within a week after the Galaxy IV failure. Each of the actions taken to implement this contingency plan required the ability to shift frequencies on which customer services were provided as needed to accommodate changes in spacecraft assignments and adjust to different satellite frequency plans.

¹⁴ HBO explained that:

HBO, like many other programming networks, has elaborate arrangements in place with its satellite capacity suppliers to restore services immediately in the event of interruption to any one of HBO's network distribution feeds. If it became necessary to implement these plans, HBO could be required to repoint antennas to different satellites and/or change to frequencies (that may not be known until the interruption event occurs) within minutes. The prospect of having to conduct a frequency coordination or to seek a modification of license under these circumstances simply would be unacceptable.

HBO Opposition at 5.

The architecture of satellite systems is also fundamentally different from that of terrestrial systems. Any earth station can generally communicate with any other earth station in the band that is within the footprint of the satellite. As a result, satellite services are particularly suitable for handling spikes in demand for telecommunications services resulting from breaking news or other short-term events. In contrast, point-to-point terrestrial links are less suitable for such events, and are therefore less likely to have sudden short-term increases in demand.¹⁶ Obviously, such events are unpredictable, and in order to respond, earth station operators need the ability to use any available frequencies to provide coverage.

Finally, flexibility is important to the efficient management of the satellite network. The FWCC Petition takes a narrow view, focusing on earth segment without acknowledging that the rules for earth stations are designed based on how they interact with space stations. As discussed above, licensing rules for spacecraft already ensure maximum efficient use of the spectrum/orbital resources. Flexibility on the ground segment side is necessary to permit full utilization of satellite resources in response to customer demand and to optimize traffic on the satellite network as customer requirements evolve.

For example, shifting frequencies used by existing customers may make it possible to accommodate a new service. As COMSAT explained in its

¹⁶ See Reply and Opposition of MCI WorldCom, Inc. at 3 (FS terrestrial stations do not require access to the full band because there is rarely any increase in demand that requires the use of additional spectrum).

¹⁷ See, e.g., Opposition of Sprint Corporation at 2-4; Reply and Opposition of MCI WorldCom, Inc. at 3.

Opposition to the FWCC Petition, it had recently been able to make an entire transponder on an INTELSAT satellite available for one of its largest customers, but only by an extensive relocation of nearly 35 carriers over a period of a few weeks.¹⁸

C. The Record Contains No Evidence that Current Policies Unfairly Disadvantage Terrestrial Operators

In contrast to the strong evidence in the record regarding the need for flexibility for satellite operations, there is absolutely no concrete information supporting the changes requested by the FWCC. In fact, it is worth noting that not a single terrestrial operator filed comments in support of the FWCC Petition. Conversely, among the opponents of the petition were service providers who rely on both satellite and terrestrial facilities to provide communications services.¹⁹ These entities, who are clearly in a position to evaluate sharing from the perspective of both terrestrial and satellite operations, expressly confirmed that the balance represented by the current rules is appropriate. MCI WorldCom, for example, flatly stated that “satellite operators and FS operators are on a level playing field with regard to coordination.”²⁰

Instead of providing direct evidence of a problem with existing policies, the FWCC Petition relied solely on speculation and generalized complaints

¹⁸ Opposition of Comsat Corporation at 20.

¹⁹ See, e.g., Opposition of Sprint Corporation, Reply and Opposition of MCI WorldCom, Inc.

²⁰ Reply and Opposition of MCI WorldCom, Inc. at 4. See also Reply Comments of ATC Teleports, Inc. at 2.

regarding increased demand for terrestrial services and allegations of spectrum shortages. *See* FWCC Petition at 8. Yet even here the FWCC tells only part of the story. The FWCC ignores the fact that terrestrial services have access to thousands of megahertz of spectrum that is not shared with satellite services. For example, Section 101.101 of the Commission's rules identifies more than 7.4 GHz of spectrum available for fixed service operations that is not shared with satellite services. If a terrestrial applicant cannot successfully coordinate a new path with existing earth stations, it can seek to use different shared frequencies or unshared frequencies instead.

The FWCC also ignores the fact that terrestrial operators have traditionally benefited disproportionately from Commission sharing policies, which are based on a first-come, first-served framework. Terrestrial operations in many of the shared bands were in place well before satellite services began, so that even the first earth stations had to work around existing fixed service links in order to find suitable sites.²¹ Earth station applicants are further limited by the requirement

²¹ In its 1970 decision establishing commercial domestic satellite services, the Commission noted that:

[T]here is some doubt as to whether domestic satellite operations can be fully and economically accommodated in the only frequency bands presently available for commercial domestic satellite communications services, *i.e.* the 4 and 6 GHz bands. It seems desirable from the standpoint of economics that earth stations be located as close as possible to population centers to avoid dissipating any savings in long terrestrial interconnections. Terrestrial use has substantially saturated the 4 and 6 GHz bands near several population centers throughout the United States and quite generally in the North-eastern states.

that, to the extent practicable, they seek out locations “where the surrounding terrain and existing frequency usage are such as to minimize the possibility of harmful interference” to terrestrial stations.²² The FWCC grumbles that earth station deployment in the 4 GHz band has made that spectrum unavailable for terrestrial growth,²³ but the fact is that there was a substantial base of terrestrial links in that band before satellite services were ever authorized. The earth stations that have been deployed in the band have had to be placed at locations that avoided interference from the terrestrial stations that were already present.

Even once the spectrum was made available for satellite services, terrestrial systems had a distinct edge. Building out a terrestrial network is easier and faster than implementing new satellite services. The long lead times that are inherent in the satellite business give terrestrial systems a clear advantage under current policies.

Furthermore, despite the FWCC’s complaints of spectrum shortages, a number of allocations for new terrestrial services both domestically and abroad have failed to attract significant interest from applicants or have resulted in default of auction pledges. Despite these failures, the Commission recently reallocated the 3650-3700 MHz band from fixed-satellite service to terrestrial fixed service usage,

Establishment of Domestic Communication-Satellite Facilities by Non-governmental Entities, 18 RR2d 1631, 1634 (1970).

²² 47 C.F.R. § 25.203(a). Many teleports are located at sites that have terrain shielding.

²³ Reply Comments of FWCC at 9 n.23.

over the strong objections of current and prospective satellite users of the band.²⁴ In short, there is no truth to the FWCC's suggestion that Commission spectrum policies overall favor satellite services at the expense of terrestrial operations.

The *Notice* itself implicitly acknowledges the lack of evidence in support of alteration in the current rules. The *Notice* specifically requests comment on the nature and extent of any coordination difficulties experienced in spectrum shared between satellite and terrestrial services. *See Notice* at ¶¶ 7, 30. There is no explanation, however, as to why the Commission moved to propose rules before developing a record as to whether a problem even exists.

On balance, the Commission must conclude that there is simply no factual basis for pursuing a change in policies here. As a result, the current rules should be retained.

D. The Commission Should Not Adopt Rules That Could Substantially Undermine the Viability of Next-Generation Broadband Satellite Systems

As discussed above, the Commission's current earth station licensing and coordination policies afford the flexibility necessary for the efficient provision of a wide range of satellite services, and the record contains no evidence that these important policies disadvantage terrestrial operators in any way. Thus, there is no reason to alter the Commission's rules in a manner that would severely disadvantage existing satellite operations. Furthermore, the drastic changes

²⁴ See *Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band, First Report and Order and Second Notice of Proposed Rulemaking*, FCC 00-363 (rel. Oct. 24, 2000).

currently under consideration could substantially undermine the viability of next-generation broadband satellite systems.

As a consequence of the first Ka-band processing round, the Commission has already licensed nearly a dozen next-generation FSS systems to provide advanced broadband services in Ka-band frequencies. The Commission is also preparing to almost double that number of licensed systems as the second Ka-band processing round is drawing to a close. As the Commission stated in its order adopting Ka-band satellite service rules:

The satellite systems that will operate in this band represent a new age in satellite communications. These systems have the potential to provide a wide variety of broadband interactive digital services in the United States and around the world including: voice, data, and video; videoconferencing; facsimile; computer access and telemedicine. The systems can provide direct-to-home services, potentially allowing customers to participate in activities from distance learning to interactive home shopping.

The commercialization of the Ka-band spectrum will give rise to a dynamic new satellite market, potentially stimulating significant economic growth both in the United States and abroad. These systems also represent an opportunity for the United States to continue its leadership role in promoting global development through enhanced communication infrastructures and services. They also represent a major step in achieving a seamless information infrastructure.²⁵

In addition to these Ka-band systems, V-band satellite systems will provide similar public interest benefits for consumers in the United States and around the globe.

²⁵ *Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Service, Third Report and Order*, 12 FCC Rcd 22310 (1997).

The Ka-band systems authorized by the Commission are currently being implemented. These systems represent multi-billion dollar commitments to the global information infrastructure, and will provide additional capacity and new services required to meet the needs of the digital telecommunications marketplace. However, in order to participate in the emerging market for broadband satellite services and to compete effectively in the rapidly changing telecommunications environment, Ka-band and other new satellite systems require, among other things, the operational flexibility inherent in the Commission's existing earth station licensing and coordination rules.

Ka-band GSO FSS systems already face significant challenges in operating in bands shared with the terrestrial fixed service. In the 18 GHz band plan, the Commission designated the 18.3-18.58 GHz band to FS and GSO FSS on a co-primary basis; and designated the 18.58-18.8 GHz band to GSO FSS on a sole primary basis, grandfathering existing fixed service operations in that band for a period of ten years.²⁶ Thus, terrestrial operators will have had unfettered access to the 18.3-18.58 GHz band for many years before Ka-band GSO FSS systems even begin to use these frequencies, and Ka-Band GSO FSS systems are required to accept the burden associated with the multi-year "head start" enjoyed by terrestrial services in the deployment of their systems. Even in the sole primary GSO FSS

²⁶ Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use, *Report and Order*, 15 FCC Rcd 13430(2000).

spectrum in the 18.58-18.8 GHz band, Ka-band systems must either accept interference from existing FS operations for ten years or incur significant expense in relocating grandfathered FS systems.

In view of the substantial challenges facing nascent Ka-band GSO FSS systems, and the advantages already enjoyed by the incumbent terrestrial services in sharing the 18 GHz spectrum, it is inconceivable that the Commission would even consider further handicapping Ka-band systems before they get off the ground by altering its earth station licensing and coordination rules in a manner adverse to satellite operations. Such an action would significantly hinder the ability of next-generation Ka-band systems to provide advanced broadband services to U.S. consumers, including those in rural and underserved areas, which plainly would be contrary to the public interest. Accordingly, the Commission should reject any notion of applying any changes in its earth station rules to satellite systems operating at Ka-band and higher frequencies.

II. THE PROPOSED USE DEMONSTRATION REQUIREMENT IS IMPRACTICAL AND WOULD UNREASONABLY BURDEN SATELLITE SERVICES

The *Notice* proposes to require an earth station operator to justify denial of coordination for a proposed new or modified terrestrial link by demonstrating past, present, or imminent future use of the frequency in question. However, as discussed below, the framework proposed by the Commission would be extremely cumbersome to apply, would require disclosure of competitively sensitive information, and would involve frequency coordinators in making determinations

for which they are ill prepared. Accordingly, the Commission should reject the proposal.

A. Making a Fair Determination of Earth Station Use Requires Consideration of a Broad Range of Complex Factors

Developing objective standards for evaluating use that would fairly take into account the range of factors involved in earth station operations would be extremely difficult, if not impossible. Although the *Notice* proposes to adopt a new rule that would require an earth station to demonstrate its use of a particular frequency channel in support of denying a coordination, the Commission states that it is deferring adoption of a definition of use. *Notice* at ¶ 49. Instead, the *Notice* simply sets forth a list of questions regarding how use should be determined without attempting to answer them. *Id.* at ¶ 54. The questions themselves, however, highlight the complexity of attempting to fairly evaluate earth station use.

Specifically, the Commission asks about a number of factors that might be relevant to determining whether an earth station has satisfied a requirement that it demonstrate spectrum use. As discussed in more detail below, a fair determination of earth station use would need to take into account all the factors set forth by the Commission. The Commission has set itself an impossible task in proposing to develop a framework that would permit appropriate evaluation of all these elements.

Frequency Diversity: The Commission seeks comment on how the need for frequency diversity should be considered in making a usage determination. As the Coalition has made clear above, every earth station operator has a legitimate

interest in the availability of alternative frequencies. Some facilities, such as teleports, routinely use transponders on a variety of different satellites covering a whole range of frequencies. However, even when a given earth station relies primarily on a single satellite and uses a smaller subset of frequencies, any number of events can create the need to shift to use of a different transponder or satellite, with an accompanying change in frequency. As discussed above, such changes can be necessitated by requirements associated with coordination agreements with other satellite operators, the need to restore service in the event of a transponder or facility outage, an increase in demand for service to or from a particular location because of an emergency or news event, the launch of a replacement satellite with advanced features and a different frequency plan, or satellite relocation or other adjustments due to management of the overall satellite communications network. Furthermore, there is no way to predict in advance when one of these events will occur or what frequency any given user will need access to in response. As a result, frequency diversity is a valid requirement for every earth station operator and would have to be an acceptable explanation in support of a claim of imminent use of a given frequency channel.

Intermittent Use: The Commission asks about situations in which the earth station operator has used the spectrum at issue intermittently but not constantly. Again, there are many circumstances in which a frequency that is not used for primary service may be needed on an occasional basis in response to customer requirements or the need for redundant services. There is simply no basis

on which the Commission could set a minimum amount in minutes or a standard based on data throughput for wideband systems that would adequately reflect the wide range of system requirements. Any past use of a frequency – intermittent or not – would have to be considered sufficient to satisfy the necessary showing.

Transponder Usage: Similarly, the Commission asks how often a particular transponder or portion of a transponder should be required to be active to be considered in use. For the same reasons mentioned previously, there is no basis on which the Commission could determine that a particular amount of time should be set as the minimum in order for an earth station operator to protect its right to use frequencies on a transponder that is in occasional but not constant use.

Future Use: The *Notice* next inquires about standards for evaluating planned future use of a frequency in a range of situations, including circumstances in which a transponder cannot be brought into use immediately because of international coordination difficulties or is needed only for redundancy. Like the other factors, these are legitimate circumstances that would justify a showing of imminent use of a frequency. As we have discussed, the ability to use certain frequencies for specific services can be constrained by limitations due to coordination with adjacent satellites. Furthermore, protecting the availability of frequencies needed to provide redundancy in the event of an equipment failure is critical to efficient operation of satellite networks.

Space Segment Assignment: The Commission also asks if a use standard should take into account situations in which the frequency is assigned at

the sole discretion of the satellite operator. Again, the answer is clearly yes.

Certain operators, notably INTELSAT, assume that a customer requesting capacity can use any available frequency within a given range.²⁷ In such circumstances, the inability to use the assigned frequency would cause loss of the capacity. Obviously in these instances the earth station operator must be permitted to protect its full access to spectrum.

Equipment Failure: Next, the Commission raises issues relating to the need for spectrum availability to plan for the possibility of transponder or satellite failure, uncertainty relating to use of a satellite nearing the end of its useful life, and other similar events. The Coalition has already addressed these matters in detail. The need to prepare for contingencies relating to potential equipment failures clearly must be accommodated by any usage standard.²⁸

Balance of Current and Future: Finally, the Commission seeks input regarding how current and future use should be balanced in determining the

²⁷ See, e.g., Opposition of Sprint Corporation at 2-4; Reply and Opposition of MCI WorldCom, Inc. at 3.

²⁸ The FWCC, although acknowledging that earth stations communicating with satellites nearing their end of life need spectrum flexibility, objects to otherwise permitting earth stations to maintain access to spectrum that will be needed in the event of a facility malfunction. Specifically, the FWCC claims that it is inequitable to “short-chang[e] the fixed service in order to protect the FSS industry against the risk of failure of its own equipment.” Reply Comments of FWCC at 13. Once again, however, the FWCC is ignoring basic differences between satellite and terrestrial operations. As we have explained, once a spacecraft is launched, there is no possibility of repairing a malfunctioning transponder. In contrast, if terrestrial equipment breaks, it can readily be repaired or replaced. Thus, the need for availability of protection frequencies for fixed satellite services reflects the realities of space-based operations, not unfair favoritism.

availability of spectrum in a coordination. For the reasons discussed above, both current and planned future use of spectrum are indispensable elements in the efficient management of a satellite network. Because customer requirements, equipment failures, frequency assignments, and other factors are highly unpredictable, earth station operators cannot make an advance showing regarding when a frequency might be brought into use or what frequency would be needed.

* * *

Even the FWCC has agreed that these factors are legitimate and should be considered in evaluating a usage showing by an earth station operator.²⁹ The Coalition frankly does not see how the Commission can craft a framework that would fairly take into account these myriad factors to reach a determination of whether or not an earth station has made a satisfactory demonstration of use.

²⁹ See *id.* at 12-13 (arguing that need for bandwidth, even when not currently used, can legitimately be demonstrated where:

- the satellite or frequency are wholly at the discretion of a space segment provider independent of the earth station operator;
- the earth station operator's business routinely requires ready access to multiple satellites;
- an earth station complex has multiple antennas pointing at multiple and changing satellites;
- an earth station operator provides service to independent third parties with unpredictable space segment needs;
- an earth station coordinates to use a satellite known to be nearing the end of its useful life; or
- an NGSO feeder link earth station requires access to the multiple satellites in a system.

Certainly there is no realistic prospect of doing so with “narrow, precise rules” that are “clear, straightforward, and enforceable.”³⁰ The question of what constitutes use is simply not an issue that is susceptible to a straightforward answer because of the range and variety of circumstances involved.

B. Demonstrating Use Would Impose Significant Burdens on Earth Station Operators and Require Disclosure of Highly Sensitive Business Information

Even if the Commission could come up with an appropriate standard for use, demonstrating that the standard was met under the FWCC’s proposal would be time consuming for operators and would require disclosure of competitively sensitive business data.

Any attempt to impose a new set of requirements based on a regulatory definition of use would exponentially increase the administrative burdens associated with coordination for earth station operators. Specifically, under the *Notice’s* proposals, each earth station would need to develop a database to document past, current, and planned future use of spectrum in order to be in a position to protect frequencies. Complying with the new showing required would be particularly burdensome for earth stations that routinely communicate with multiple satellites, including those that provide occasional use services. As a result, the proposal would impose unnecessary costs on operators that would have to be passed on to satellite service customers.

³⁰ See *Notice*, Separate Statement of Commissioner Harold Furchtgott-Roth at 1.

The proposal has other serious implications for operators. Information regarding past and present use is generally considered confidential by operators. This type of information is competitively sensitive because a rival could use it to target the operator's customers. In addition, the Commission suggests that claims of imminent future use might need to be supported by service contracts, which are also highly confidential.

The problem is compounded because the Commission proposes that in the first instance, usage information would be provided to the frequency coordinator. The Commission does not suggest any procedures for ensuring that the coordinator protects the confidentiality of this information. Today, even if a frequency coordinator has been retained by an earth station licensee to provide frequency protection, the coordinator does not normally receive confidential business information from the operator. Operators will be extremely reluctant to disclose such information to a frequency coordinator who routinely represents a wide range of competing licensees, both satellite and terrestrial. The Commission simply cannot expect that earth station operators will release competitively sensitive documents without any guarantee that their confidentiality will be maintained.

In the event of a dispute regarding the frequency coordinator's decision, the *Notice* proposes that any relevant information be supplied to the Commission for evaluation. The Commission asks whether the information received by the Commission should receive confidential treatment. *See Notice* at

¶ 53. Clearly, the answer is yes. Yet the Commission does not propose any concrete actions to ensure that sensitive business information is not disclosed.

There is simply no justification for adopting policies that would impose substantial new record-keeping responsibilities on earth station operators and require routine disclosure of highly confidential documents relating to earth station usage. For this reason alone, the proposal to require demonstration of use should be rejected.

C. The Proposed Rule Would Increase Burdens on Commission Personnel

The proposed rule change would also lead to a substantial increase in administrative burdens on the Commission staff. Under existing policies, the Commission relies on the parties to a coordination to exercise good faith in weighing technical and business issues relevant to the proposed new service. Because the Commission has not imposed any significant level of regulation on the process, the parties can resolve disputes without invoking Commission intervention.

The proposal for requiring an earth station to justify denial of coordination by demonstrating its use of the frequency at issue would change this situation dramatically. Specifically, the proposal would for the first time impose regulatory limitations on coordination issues, leading to questions regarding the proper interpretation of Commission standards and the legitimacy of decisions applying those standards in any individual case.

The stakes are high for both satellite and terrestrial operations. In areas where demand for spectrum is particularly intense, decisions that affect

access to that spectrum are likely to be contentious. As a result, it can be expected that frequently the party adversely affected by a frequency coordinator's decision will invoke Commission review. This is particularly true in light of the complexity of the factors that would bear on any determination of use, as discussed above. Thus, the proposed rule change, if adopted, would likely lead to a substantial influx of disputed cases regarding coordination issues that Commission staff would be called on to resolve. This would place an additional burden on the limited time and resources of the Commission.

Furthermore, even when a case does not lead to a challenge, Commission action will be necessary. As the *Notice* recognizes, any instance in which a terrestrial operator is granted access to a frequency over the earth station operator's initial objection will effectively result in modification of the earth station license. *See Notice* at ¶ 58. Specifically, if the earth station operator had been initially licensed for the full band, the effect of the decision will be to make the frequency to be used by the terrestrial operator unavailable to the earth station licensee in the future. Presumably, this change would need to be reflected in the Commission's licensing database. Simply having a record of the change kept by the frequency coordinator would lead to discrepancies between the licensing database and the information held by the frequency coordinator, increasing the possibility for disputes. The *Notice* does not sufficiently recognize or address these issues.

D. The Proposal Would Unreasonably Constrain the Flexibility of Satellite Service Operations

Even if these fundamental administrative and procedural hurdles could be overcome, the proposed rule should be rejected because it would severely limit satellite operations. As discussed above, flexibility to shift spectrum used is essential to efficient satellite system utilization of shared spectrum. The Coalition has explained in detail that access to diverse frequencies is needed to ensure that an earth station operator can restore service in the event of an outage, can utilize spectrum channels assigned by a space station operator, can adjust to the need for coordination among adjacent satellites, and can ensure the availability of frequencies in the event of a spike in demand due to an emergency or news event. Furthermore, it is impossible to predict in advance when a spectrum shift might be necessary or what frequency will be available for use at that time.

Despite the FWCC's protestations that it does not seek changes that would "impair earth station operators' legitimate needs for flexible spectrum use,"³¹ the impact of this proposal would be to do exactly that. It would permit fixed service operators to chip away at available spectrum for an earth station operator, significantly increasing the likelihood that service restoration will be impossible in the event of a malfunction in the spacecraft primarily relied on by the earth station's customers. Reduction in access to spectrum will also interfere with network management and impair the operator's ability to respond to changes in demand for service. Especially in light of the absence of any concrete evidence that

³¹ Reply Comments of FWCC at 5.

the current system is actually harming terrestrial operators, the Commission should not adopt requirements that would so substantially limit the flexibility on which satellite networks rely.

E. Use Determinations Should Not Be Made by a Frequency Coordinator

The demonstrated use proposal is flawed because frequency coordinators are ill-prepared to evaluate usage demonstrations. As discussed above, any given determination regarding earth station use will involve a range of factors relating to the types of services provided, the need for redundancy, and the need to maintain efficient network management. The Commission has not yet even attempted to develop a framework – assuming for the purposes of argument that a framework could be developed – that would equitably reflect these requirements of earth station operations.

Frequency coordinators simply do not have the qualifications to interpret Commission policies or weigh the range of business and technical issues relevant to a usage evaluation. Essentially the Commission is asking a third party to perform an adjudicatory role in a situation in which the coordinator clearly lacks the necessary expertise. Furthermore, frequency coordinators, who typically represent clients in both the terrestrial and satellite industries, may have no interest in being put in a position where instead of facilitating coordination, their job is to choose winners and losers in a conflict over access to spectrum.

The *Notice* does not even attempt to justify delegating this responsibility to frequency coordinators, assuming the Commission even has the

authority to delegate this function. Earth station operators are entitled to have determinations that will affect their future access to spectrum made by qualified, unbiased decision-makers.

F. The Technical and Operational Characteristics of Ka-band and Higher Frequency Satellite Systems Preclude Application of Demonstrated Use Requirements

As described throughout these Comments, the Commission should not apply demonstrated use standards to FSS earth stations. Many, if not all, of the problems associated with such standards being applied at lower frequency bands also exist in higher frequency bands shared with the fixed service (*e.g.*, the 18.3-18.58 GHz band). Furthermore, the Ka-band FSS systems licensed by the Commission will employ advance satellite communications technologies that are significantly different from traditional C and Ku-band systems to provide on-demand, two-way broadband communications with a wide range of data rates that accommodate individual user requirements in real time.³² The use of these advanced technical characteristics, as detailed below, provide additional reasons why it would be illogical to apply the proposed demonstrated use standards to the Ka-band and other higher frequency satellite systems.

For instance, Ka-band systems generally plan to utilize wideband 125 MHz to 500 MHz transponders to provide broadband services to consumers. In these broadband systems, packet communications techniques are used whereby

³² For instance, a user may require varying amounts of bandwidth on a day-to-day basis. This changing requirement can be met by Ka-band systems employing real-time dynamic resource allocation capabilities.

each earth station within a downlink beam receives the same wideband downlink signal. Once the wideband downlink transmission is received, each earth station retrieves the data packets specifically addressed to it.³³ Since the Commission's intent is to exploit known frequency usage to facilitate sharing with terrestrial services, and the wideband signal is always in use by earth stations within the satellite beam based on the demand of the particular users, it is not feasible to demonstrate earth station "use" for these types of systems as proposed by the Commission.

In order to further increase spectrum efficiency and satellite capacity, Ka-band satellite systems are also being constructed with antenna spot beam technologies that maximize frequency re-use. Depending on the frequency re-use plan employed, each spot beam will generally employ a single wideband channel (*e.g.*, 250 or 500 MHz channel) and polarization at the initiation of service. Given the number of Ka-band networks to be deployed and the variation in the beam coverage patterns of each system, it is expected that the wideband channels of the different satellite networks will use the full 500 MHz of 18 GHz spectrum in the same geographic area. Moreover, many Ka-band systems plan to co-locate multiple satellites at the same orbit location in order to maximize system capacity through the use of all of the wideband channels (available frequencies) in each spot beam. It is clear from the above that earth stations within the geographical area covered by

³³ This stands in stark contrast to the typical FDM access architecture used at lower frequency bands where a single earth station can receive a variety of specified, relatively narrower bandwidth signals over time.

these satellites will need to be capable of receiving data from any satellite across the 500 MHz of 18 GHz spectrum. In view of the foregoing, it is likely that the entire 18.3-18.8 GHz band will be used by earth stations of many Ka-band GSO FSS systems at all times in a given geographic area.

The above paragraphs describe some of the fundamental aspects of the technologies that will be employed by Ka-band and higher frequency satellite systems. These clearly provide reason enough why the contemplated notion of demonstrated earth station use is not appropriate for satellite systems that operate at higher frequencies such as Ka-band and V-band. However, there are other differences between transmissions in the C/Ku-band versus Ka/V-band that preclude the application of demonstrated use standards for reasons beyond those that militate against demonstrated use in the lower frequency bands.

For instance, higher frequency satellite systems will suffer greater propagation losses than systems operating at lower frequencies. In order to compensate for the greater rain attenuation, systems operating at higher-frequencies may use earth station site diversity when very high reliabilities are required by the system or its users

With earth station site diversity, earth stations are deployed at a certain minimum separation distance with both earth stations simultaneously receiving the same satellite downlink signal. As heavy rain occurs, the diverse site is engineered such that it is highly probable that the rain event will not affect both earth stations at the same time. At any given time, the earth station site with the

most reliable signal will be used. Thus, the two earth stations will not simultaneously use the spectrum. In this case, the frequencies used by each earth station must be fully protected from terrestrial services at each site all the time, even though the receive signal from only one earth station is actually being used at any given time.

Furthermore, in certain of the Ka-band systems, it is planned to use a full 500 MHz (18.3-18.8 GHz) in many spot beams from the commencement of service. In addition, some systems intend to implement steerable beams, which are capable of serving any portion of the Earth visible to the satellite above a certain elevation angle. In this case, each earth station needs to be capable of receiving data on any of the authorized Ka-band frequencies of that network. This provides maximum flexibility in the operation of the network resulting in most efficient use of the limited resources available. Again, as Ka-band systems plan to use their entire authorized bandwidth in each beam, consideration of applying a demonstrated use standard does not make sense, and would needlessly impose regulatory burdens on the satellite systems with no promise of additional spectrum for the fixed services at a given site.

For the reasons given above, it is clear that the Commission's proposed demonstration of use standard is inappropriate for higher frequency systems.

G. Any Proposal for a Spectrum Efficiency Standard for Earth Stations Would Be Unworkable

The *Notice* does not propose a specific efficiency standard for spectrum use by earth stations, but seeks comment as to whether the Commission should attempt to develop one. The Coalition strongly urges the Commission not to engage in such an effort. In fact, the FWCC has made clear that even it does not believe that adoption of a spectrum efficiency standard for satellite operations would be appropriate.³⁴

As the Commission recognizes in the *Notice* (§§ 33-39), there are fundamental differences between terrestrial and satellite systems that do not allow the importation of a spectrum efficiency rule for terrestrial services into the regulation of satellite services. These differences are reflected in the separate FCC rule parts governing terrestrial and satellite services.

Satellite services, with the exception of DBS, are regulated under Part 25 of the Commission's rules. The efficiency of satellite systems is ensured in a myriad of ways under the current provisions of Part 25, as the Commission describes in detail in the *Notice* (§ 39, n.71). The objective of these regulations is to ensure efficient use of the orbital resource and the spectrum. For instance, the Commission's long-standing two-degree spacing requirement for GSO FSS systems maximizes the efficient use of the spectrum and orbit resource. Two degree spacing

³⁴ See Reply Comments of FWCC at 6 ("We understand that bits-per-Hertz standards for FSS would be unrealistic in view of long lead times and numerous other constraints on satellite system design, and we do not believe they are generally necessary for equitable sharing.").

allows the simultaneous operation of 40 GSO FSS systems from about 60° W.L. to 140° W.L., each capable of providing co-frequency, co-coverage service to the United States. In order to maximize the capacity of a given orbit location, FSS licensees are required to provide full frequency re-use.³⁵ The Commission's rules also specify stringent antenna sidelobe suppression requirements.³⁶ These requirements, as the Commission notes, facilitate sharing with terrestrial services by narrowing earth station antenna beamwidths and increasing off-axis side lobe suppression.

In contrast, the efficiency standards for terrestrial systems to which the FWCC and FCC (*Notice* at ¶ 59) refer are very different and require that a system provide a certain number of bits/sec per Hertz. There is no evidence that additional efficiency standards are needed to ensure the efficient operation of satellite systems. In fact, unlike the case for terrestrial systems, there are very real physical and practical limitations to the additional spectral efficiency that can be achieved in most satellite systems.³⁷ The satellite regulatory environment discussed above, coupled with these limitations and the sheer cost involved in constructing and launching a single satellite, much less a constellation of satellites within a system, results in the satellite operator needing to obtain the greatest capacity practicable over a given bandwidth for economic survival. This

³⁵ Sections 25.210(d), (e), (f) & (g).

³⁶ Section 25.209.

³⁷ Most satellite systems use QPSK modulation, coupled with sophisticated spectral shaping to minimize the bandwidth requirements for a given digital transmission rate.

environment clearly precludes any conceivable need for the application of efficiency standards, as suggested in the *Notice*.

III. THE PROPOSED CHANGES IN INTERFERENCE COORDINATION PROCEDURES ARE UNNECESSARY AND UNDULY REGULATORY

The *Notice* also proposes changes in the procedures for coordination of satellite and terrestrial facilities in shared spectrum. Specifically, the *Notice* suggests that in certain circumstances, the analysis and outcome of one coordination should affect future coordinations involving the same or different parties. These new rules are unnecessary and would be impractical to implement. Therefore, the Commission should reject them.

A. The Commission Should Not Impose Requirements Regarding Interference Models

First, the *Notice* proposes to adopt a requirement regarding the use of coordination models. Under this proposal, if an earth station operator accepts a model reflecting certain interference mitigation techniques in order to coordinate its station initially, it would later be required to accept the same model for a subsequent coordination to the extent the same conditions exist. *See Notice* at ¶ 78. For example, if an earth station operator agrees that a building would block otherwise harmful interference, it must later assume the same degree of blockage in later coordinations involving similar paths.

There is no basis for imposing this requirement. First, as discussed above, the FWCC has provided absolutely no evidence of a need for this new rule. The FWCC's justification for this proposal is that "like cases should be treated

alike.” *See id.* at ¶ 72. But there is simply no record demonstrating that operators of either terrestrial or satellite facilities are routinely treating similar cases differently. To the contrary, the Coalition believes based on the experience of its members that in virtually all cases, both types of licensees use sound engineering principles and apply those principles consistently.

Thus, in some instances an earth station operator needs to demonstrate that a building or other terrain feature will provide signal blockage in order to coordinate a new or modified facility with a potentially affected terrestrial operator. One would expect that the blockage would also be recognized in future coordinations between those parties, and generally this is the case. The same is true, in our experience, when the situations are reversed, and a terrestrial operator has done the initial analysis to facilitate siting of its link. Any rational operator recognizes that when facilities are located close to each other in shared spectrum, coordination may not be a one-time event, but may involve a series of issues with compromises likely to be required on both sides. As a result, there are incentives on both sides to deal equitably and reasonably with neighboring users.

However, even when a coordination involves the same two parties at the same locations, there are other factors that may justify a change in result from one coordination to the next. As the *Notice* recognizes, “[e]very coordination request is likely to differ from earlier requests in some respects.” *Notice* at ¶ 73. Thus, the potential for harmful interference will depend on a wide range of factors that may vary from case to case, even when the same two facilities are involved. These

factors include the power level and modulation of the wanted and interfering signals, the distance between the structure or obstacle and the transmitting station and their relative heights, the antenna patterns involved, and others. As a result, acceptance of a particular model regarding terrain blockage will not in and of itself determine the outcome of future coordinations between the parties.

Of course, when different parties and different facilities are involved in the subsequent coordination, the probability of a different outcome is much greater. Even a small distance between the facilities at issue in the first coordination and the subsequent coordination can create a significant change in the impact of any terrain blockage. In fact, because a blockage analysis is path-specific, a calculation done for one coordination may not provide any useful information regarding a subsequent coordination if the sites involved are not exactly the same.

The language of the proposed rule does not adequately reflect these problems. Instead, the rule states simply that if an earth station licensee accepts a particular interference model relying on terrain or building blockage at its initial coordination, it must accept the use of the same model in subsequent coordinations. *Notice* at Appendix C, proposed § 25.203(e)(2). In contrast, in discussing the proposal in the text of the *Notice*, the Commission makes clear that the requirement to accept the same coordination model applies “only to the extent that [the] same conditions exist for subsequent requests for coordination.” *Id.* at ¶ 78. This qualifying language is inexplicably absent from the text of the proposed rule.

Because there is so much variation in factors from one coordination to the next, there is simply no reason to expect that adopting the requirement proposed in the *Notice* will benefit either satellite or terrestrial operators significantly. Instead, incorporating this procedure into the rules will simply interject an unnecessary constraint, limiting the flexibility of both sides in coordination discussions.

Even worse, it could lock in the use of a coordination model that might become outdated. Buildings are constructed and torn down, terrain features can be altered, and these changes would clearly be relevant to determining the potential for harmful interference between two stations.³⁸ The *Notice* seems to recognize the need to adapt coordination models to these types of changes in the interference environment (*see id.* at ¶ 79), but provides no procedure for accomplishing this.

Finally, the proposal raises other issues that the *Notice* does not address. For example, the *Notice* suggests that the results of any path analysis performed on behalf of an operator would be available to other satellite and terrestrial licensees and applicants in the surrounding area. However, these analyses are done only on specific request at the expense of the requesting operator or applicant. The *Notice* does not even discuss whether it is appropriate to require

³⁸ See, e.g., HBO Opposition at 6:

[The FWCC's] proposal ignores the very real instances where the environment around an earth station facility changes over time, as new radio interference sources are introduced, the terrain is altered by construction, and buildings are built and demolished. These real world changes are precisely the reason that careful coordination between earth stations and terrestrial facilities is necessary.

an entity that pays for a link analysis to make the information available to other operators in future coordinations.

In sum, the proposal with respect to interference models is not based on any factual evidence of an existing problem. The solution put forth is unnecessarily regulatory and overly simplistic given the wide range of factors that can affect any given interference analysis. The proposal does have the benefit of being even-handed, since if adopted it would apply to earth station and terrestrial operators alike, unlike the other proposals in the *Notice*. However, the Coalition believes it would benefit neither earth station operators nor terrestrial operators. Accordingly, the proposed rule should be rejected.

B. The Commission Should Not Deny Future Protection to an Earth Station Operator that Has Agreed to Accept Limited Interference

The *Notice* also proposes that if an earth station in its initial coordination accepts a level of interference that “is recognized to be below accepted interference objectives” along a set of azimuths and elevation angles, then it would not be entitled to any future protection in the same frequencies for the same set of azimuths and elevation angles. *Notice* at ¶ 78. This proposal is also misguided and would be impractical to implement.

In explaining the underlying rationale of this proposed rule, the Commission states that:

it would not seem reasonable to allow an FSS earth station licensee to preclude future FS station use of a part of the spectrum in which the earth station licensee has already accepted levels of interference

from other FS stations that would preclude its use of that particular part of the spectrum.

Id. at ¶ 76. Thus, the Commission’s proposal seems intended to address a situation in which an earth station operator has been forced to “write off” a portion of the spectrum due to interference from a pre-existing terrestrial operator but nevertheless attempts to deny coordination to a subsequent proposed use of that spectrum by another terrestrial applicant.

Again, however, there is simply no evidence that this is a problem under current procedures. Neither the FWCC nor any other commenting party in this proceeding to date has introduced any information to suggest that insistence by earth station licensees on protecting spectrum they cannot use is a common – or even an occasional – occurrence. Based on the experience of its members, the Coalition has no reason to believe that this is a significant problem. Thus, there is no justification for the rule change proposed.

Furthermore, the Commission’s proposed solution is based on unsupported assumptions, and the *Notice* provides no guidance on how the new rule would be implemented. For example, the proposed rule would apply whenever an earth station accepts interference “that is recognized to be below accepted interference objectives . . . and therefore insufficient to clear the interference case.” *Notice* at Appendix C, proposed § 25.203(e)(3). This seems to assume that there would be a common understanding of “accepted interference objectives” that would be uniform for every earth station. But that is simply not the case. The amount of interference that might be accepted on a given frequency without making that

frequency unusable will vary from situation to situation, depending on a wide range of factors including the types of services being offered by the earth station and a myriad of technical parameters. As a result, no one-size-fits-all standard would be appropriate.

The *Notice* seems to nevertheless assume that a frequency coordinator would be in a position to determine whether a given frequency has been rendered unusable due to interference from a prior licensee. Yet the *Notice* supplies no framework for the coordinator to apply in order to make this decision.

Finally, as the *Notice* recognizes, the interference impact of any given fixed service installation on an earth station operator's use of frequencies is specific to the technical parameters in a given case. Thus, even when interference from an existing fixed station is substantial, the impact of the interference is limited to a given set of azimuths and elevation angles. A small difference in the location of the fixed station may have a significant impact on the interference effect. As a result, the proposed rule would only come into play when a subsequent fixed operator seeks to use the same frequency within the same set of azimuths and elevation angles.

This limitation is clearly appropriate given the realities of the interference environment faced by earth station operators. However, it suggests that the occasions in which the rule will even be relevant will be quite limited.

IV. THE HUGHES PROPOSAL FOR BLANKET LICENSING OF 18 GHz TERMINALS IN SHARED SPECTRUM SHOULD BE ADOPTED

The Satellite Industry Coalition supports the proposal made by Hughes that the Commission adopt a licensing approach to facilitate the ubiquitous deployment of GSO FSS earth terminals in the Ka-band spectrum shared with FS systems. As the Commission is well aware, the Ka band represents the "next frontier" for the GSO FSS, and will support a new class of high-speed broadband service, deployed by satellite on a ubiquitous basis, to end-users throughout the United States. The launch of a single Ka band satellite will instantly offer the promise of high-speed connectivity to nearly every part of the U.S., even those parts that never may be served by DSL, cable modems, fiber optics, or other high speed terrestrial services.

To facilitate the prompt provision of service to those end-users, the Coalition urges the Commission to consider the least burdensome earth station licensing procedures possible. In particular, blanket licensing of GSO FSS earth stations throughout the 18 GHz bands would obviate the need for a separate earth station license for each individual terminal. Thus, it would reduce the regulatory burden on both the earth terminal applicant and the FCC and also would greatly facilitate the provision of broadband satellite service to the public.

It is significant that the Commission already has in place a comprehensive regime to govern the routine licensing of earth terminals at Ka band. Based on an industry recommendation, the Commission has adopted at Section 25.138 of its Rules various operational parameters that ensure compliance

with the Commission's two-degree orbital spacing policies for Ka band GSO spacecraft, such as downlink PFD and uplink off-axis EIRP values. These parameters are the basis for the routine licensing of GSO FSS Ka-band earth stations. Those rules enable the routine licensing of ubiquitous earth terminals in the other parts of the Ka band designated for the GSO FSS on a sole primary basis (28.35-28.6 GHz, 29.5-30.0 GHz, 18.58-18.8 GHz, and 19.7-20.2 GHz). The industry working group that recommended those parameters concluded that they would be equally applicable in any part of the Ka band in which the Commission permits blanket licensing. Thus, the technical bases for permitting blanket licensing throughout the 18 GHz band have already have been established.³⁹

Moreover, this proposal is consistent with long-established Commission policies that have allowed blanket and streamlined licensing in other bands for many years. Those highly-successful licensing approaches have been instrumental in facilitating the growth of satellite services in the C and Ku bands, by shortening the licensing process, eliminating the need for operators to submit and for the Commission to consider redundant information, and reducing the regulatory burden on both the Commission and end users of satellite services. Wherever it can do so, the Commission should facilitate the issuance of a single license to cover large numbers of technically-identical earth terminals, rather than requiring the filing of multiple applications and the issuance of duplicative authorizations.

³⁹ Appropriate modifications to Section 25.138 would be required.

This proposal also reflects the fact that satellite terminals operate at 18.3-18.58 GHz only in the “receive mode.” These terminals do not transmit in these frequencies and, thus, they are not capable of causing interference to terrestrial users in this band. In recognition of the fact that earth terminals cannot cause interference when they receive, and as part of a general trend toward deregulation, the Commission decided [almost twenty years] ago that it no longer would license receive-only terminals. Rather, when those terminals operate in receive bands that are shared terrestrially, such as the C-band, Commission Rules provide the earth terminal user with an *option to voluntarily coordinate* with terrestrial users and/or to *voluntarily register* the satellite antenna for frequency protection.

In short, the proposals from Hughes take into account relevant regulatory considerations and provide a mechanism that facilitates expeditious deployment of earth terminals, and an option to register the receive band for interference protection from terrestrial users.

The Coalition also supports the proposal that the Commission adopt a suitable fee for a blanket license earth terminal application. The Commission will need to adopt a blanket license application fee for Ka-band earth terminals in the 29.5-30.0, 28.35-28.6, 18.58-18.8 and 19.7-20.0 GHz bands, and the fee should be the same for terminals operating in other Ka-band spectrum. Of course, any subsequent and optional frequency registrations in the shared 18.3-18.58 GHz band would require additional filings with the Commission. Taking into account the fact

that the processing of those registrations should be routine and non-controversial, as it is with C-band today, the Coalition endorses the proposal that the Commission adopt a “batch” fee that would allow a number of terminals to be registered together for a single fee. Moreover, adopting a low "batch fee" will facilitate the broadest possible distribution of these advanced broadband terminals and reduce costs to end-users.

CONCLUSION

For the reasons set forth above, the FWCC proposals for changes in the licensing and coordination of earth stations, as modified and proposed in the *Notice*, are unnecessary and counter-productive and should be rejected. The Coalition, however, urges the Commission to adopt the Hughes proposal for streamlined licensing of 18 GHz terminals.

Respectfully submitted,

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